

**REMARKS**

Applicants respectfully request reconsideration and allowance of all pending claims.

**I. Status of the Claims**

Upon entry of this amendment, claims 1-7, 17, and 65-77 remain pending.

Applicants note that the previous rejection of claims 1-7, 65-71 and 74 under 35 U.S.C. §103(a) over Creutz, deceased et al. US 4,110,176 has been withdrawn in view of Applicants' prior amendment (Amendment I) and new grounds of rejection.

Applicants further note that the previous rejection of claims 17 and 72-73 under 35 U.S.C. §103(a) over Creutz, deceased et al. in combination with Barstad et al. (US 6,444,110) has been withdrawn in view of Applicants' prior amendment (Amendment I) and new grounds of rejection.

**II. Claim Rejections - 35 U.S.C. §112**

Reconsideration is respectfully requested of the rejection of claims 76 and 77 under §112 as failing to comply with the written description requirement.

In paragraph [0040] at p. 4 of the published application (US 2003/016843), the original specification provides unequivocal support for the "about 10 g/L to about 50 g/L copper ion" range specified in claim 76. One skilled in the art would readily understand that the specification teaches the combination of this copper ion concentration range with the 150 to 225 g/L sulfuric acid content taught in paragraph [0035] and specified in claim 65, from which claim 76 depends.

Similarly, the claim 77 range of 59 to 75 g/L for copper sulfate concentration, expressed as copper sulfate pentahydrate, is explicitly supported in paragraph [0035] along with the

copper ion concentration to which it corresponds (15 to 19 g/L). The sulfuric acid concentration of claim 65, upon which claim 77 also depends, i.e., 150 to 225 g/l, is explicitly set out in the very same paragraph (§[0035]) as the copper sulfate pentahydrate range.

The claim states that the bath "comprises copper sulfate in a proportion equivalent to between about 59 g/L and about 75 g/L copper sulfate pentahydrate" because the pentahydrate is a form of the solid salt copper sulfate salt that loses independent existence in aqueous solution. "Pentahydrate" refers to 5 water molecules that are bonded to each molecule of copper sulfate in the solid state. Copper ions in solution may also be hydrated, but, with regard to the extent of solvation, an aqueous solution produced by dissolving copper sulfate pentahydrate does not differ from an aqueous solution produced by dissolving anhydrous copper sulfate.

With regard to the copper ion concentration range of "between about 10 mg/L and about 50 g/l" as set out in claim 76, the examiner actually quotes the language that explicitly supports this feature. Apparently, the rejection is based on the slight difference in verbiage between the range as stated in the specification vs. the range as covered by the claim, i.e., the specification says "[f]or copper or copper ions, the compositions vary from on the order of 10/L to on the order of 50 g/L" whereas claim 76 says "comprises copper ion in a proportion between about 10 g/L and about 50 g/L." Applicants respectfully submit that the meaning of these phrases is either identically the same or, if any difference between them is perceived, the phrase "on the order of 10 g/L to on the order of 50 g/L" in the specification unequivocally conveys to one of ordinary skill in the art that the applicants also had possession of "about 10 g/L to about 50 g/L." As a matter of

common sense, the bridge between these phrases is so minimal that one skilled in the art would instantly comprehend that the inventor could not be in possession of one without being in possession of the other.

In view of the instant amendments, reconsideration is respectfully requested of the rejection of claims 70 and 73 as lacking proper antecedent for "sulfur content." Based on the instant amendments, the grounds for rejection of these claims have been met and the rejections should be withdrawn. By insertion of the phrase "said overall" before "sulfur content," it is respectfully submitted that these claims now identify a proper antecedent, i.e., "overall sulfur content" as recited in line 10 of claim 1.

Reconsideration is respectfully requested of the rejection of claim 75 under 35 U.S.C. §112 with respect to the term "the electroplating bath comprises" copper ion in a proportion between about 50 g/L and saturation. The further limitation is in the range of copper ion content. Claim 65 calls for the bath to "further include" sulfuric acid that is present in a specific range, i.e., "between about 150 g/L and about 225 g/L," and imposes no limitation on the range of copper. Thus, the recitation in claim 75 of a range for copper unambiguously adds a further limitation. With regard to the phrases underlined in the Office action, i.e., "comprises" with respect to copper in claim 75 and "further includes" with respect to sulfuric acid in claim 75, each is an open-ended term that positively calls for recited component to fall within the specified concentration range, but does not exclude the presence of other components.

Both claims 76 and 77 are amended herein to depend from claim 65. This eliminates confusion caused by the prior dependency of claim 76 from claim 75 and the prior dependency of claim 77 from claim 76. Otherwise the requirement in claim 76

that the bath "comprises copper ion in a proportion between about 10 g/L and about 50 g/L" and the requirement in claim 77 that the bath "comprises copper sulfate in a proportion equivalent to between 50 g/L and about 75 g/L copper sulfate pentahydrate" further limit claim 65 in a manner parallel to the alternative manner in which claim 65 is further limited by the language of claim 75 as explained hereinabove.

In view of the instant amendments and the explanations offered above, it is respectfully submitted that the rejections of claims 70, 73 and 75-77 under §112 should be withdrawn.

**III. Rejection of Claims 1-3, 5-7, 65, 66, 70, 71 and 75-77 Under 35 U.S.C. §103(a)**

Reconsideration is respectfully requested of the rejection of claims 1-3, 5-7, 65-66, 70-71 and 75-77 under §102(e) as either anticipated by or obvious from Barstad et al. US 2006/0183328.

At the outset, it should be recognized that the Barstad 2006/'328 publication is a continuation-in-part of Barstad US 6,444,110, but that the 2006 publication contains no added disclosure that is relevant in any way to the process as claimed herein. Inasmuch as the rejection over Barstad '110 has been withdrawn, it is respectfully submitted that there is no basis in the record for rejection over Barstad US 2006/'328.

As explained in response to the previous Office action, the Barstad references entirely fail to disclose a process which uses an electrolytic bath comprising a reaction product of benzyl chloride and hydroxyethyl polyethylenimine as required by claim 1. For that matter, the Barstad references fail to disclose any additive they characterize as a "defect-reducing agent." Much less do either Barstad '110 or Barstad 2006/'328 disclose or suggest the incorporation of the reaction product of

benzyl chloride and hydroxyethyl polyethylenimine or any other defect-reducing agent in a proportion that would "increase an overall chloride content ... of the copper deposit." They offer not the remotest suggestion that enhanced chloride content can impart creep resistance, or that there would be any purpose whatsoever for enhancing chloride content of the deposit.

Nor is there any basis for contending that the electrolytic bath as described in Barstad could inherently contain a reaction product of benzyl chloride and hydroxyethyl polyethylenimine in an amount effective to increase overall chloride content of the deposit.

The disclosure in the two Barstad references that is relied on for the rejection relates to what Barstad et al. characterize as "leveling agents." Barstad et al. provide a substantial list of leveling agents but the list does not include the reaction product of benzyl chloride and hydroxyethyl polyethylenimine. Barstad et al. also list several U.S. patents as describing additional alternative leveling agents. But none of the leveling agents described in any of these patents comprises the reaction product of benzyl chloride and hydroxyethyl polyethylenimine.

The Office action directs attention to two of the prior patents cited in the Barstad text as allegedly relevant to the use of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine, i.e. US 3,770,598 and US 4,555,315. Inspection of these references reveals that neither of them meets the deficiencies in the disclosure of Barstad.

U.S. patent 3,770,598 discloses that N-alkylated polyethyleneimine can be incorporated as "brightening" agents in copper electrodepositing baths. The '598 patent also discloses a long list of compounds that may be used to alkylate polyethyleneimine in order to produce the brightening agent. The preferred alkylation agent is benzyl chloride. However,

there is no teaching or suggestion in the reference of the reaction product of benzyl chloride and hydroxyethyl polyethyleneimine. To the extent there is a suggestion to use benzyl chloride to alkylate polyethyleneimine, this is not the same as reacting benzyl chloride with (already alkylated) hydroxyethyl polyethyleneimine.

In the lengthy list of alkylating agents in the '598 patent there is mention of "epoxide." The reference does not further elaborate, so one skilled in the art cannot tell what specific epoxide the reference is proposing from among the myriad of alternative compounds which somewhere contain an epoxy group. No example is given.

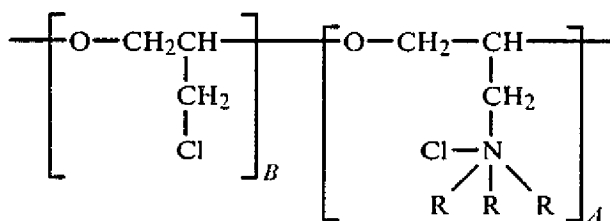
More importantly, there is no disclosure or suggestion of a brightening agent or leveler in which the polyethyleneimine is reacted with both ethylene oxide (which could yield a hydroxyethyl group) and benzyl chloride. On the contrary, the reference clearly conveys to those skilled in the art that benzyl chloride and an "epoxide" are alternatives, each of which may be used instead of the other, each of which renders the use of the other unnecessary. The '598 patent contains no remote suggestion that the presence of any of the brightening agents therein described would have any effect on the chloride content of the deposit, or that such a deposit would contribute to creep resistance, or that an enhanced chloride content could have any useful effect.

Thus, one skilled in the art who was led from Barstad to '598 would have had no reason to modify the levelers described in either reference to produce the reaction product of benzyl chloride and hydroxyethyl polyethylenimine and select the latter as a defect-reducing agent for any purpose. Nor would one skilled in the art have had the slightest reason to expect that the use of such modified polyethylenimine would enhance the

chloride content of the deposit, or that there would have been any purpose in doing so.

US 4,555,315 also fails to disclose or suggest any additive functioning as a defect reducing agent. It further fails to suggest the use, for any purpose, of an additive comprising the reaction product of benzyl chloride and hydroxyethyl polyethylenimine. The reference describes a copper plating bath additive system comprising controlled relative concentrations of a bath soluble polyether, a bath soluble divalent sulfur compound, a bath soluble adduct of a tertiary alkylamine and epichlorohydrin, and a bath soluble reaction product of polyethyleneimine and an alkylating agent.

Like US 3,770,598, US 4,555,315 discloses the presence of the reaction product of benzyl chloride and polyethyleneimine, but contains no disclosure or suggestion of an additive comprising a reaction product of benzyl chloride and hydroxyethyl polyethylenimine. The only alkylene oxide reaction product disclosed in the '315 patent is the adduct of a tertiary alkylamine and epichlorohydrin. This adduct is a quaternary ammonium salt corresponding to the formula:



wherein:

R is the same or different and is methyl or ethyl

A and B are integers whose sum is an integer of from about 4 to about 500, and

A:B is at least about 1:5.

This generic structure neither encompasses, discloses or suggests the reaction product of benzyl chloride and hydroxyethyl polyethylenimine.

The various alkylated polyethyleneimine compounds that are suggested by '315 include the reaction products of polyethyleneimine with benzyl chloride, allyl bromide, propane sultone, dimethyl disulfate, or the like. There is no suggestion of alkoxylation of the polyethyleneimine, and even less suggestion of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine.

Like the '598 patent and the two Barstad references, the '315 patent contains no disclosure of any defect-reducing agent, no suggestion that any additive it does disclose would enhance the chloride content of the copper deposit, no suggestion that enhancing the chloride content of the deposit would serve any purpose, and not the remotest suggest that enhancing the chloride content of the deposit would contribute to creep resistance of the deposit.

It is respectfully submitted that novelty and non-obviousness of the process of claim 1 are supported by Barstad's disclosure that the use of a leveler is only optional, Barstad's further teaching that the leveler, when used at all, is present in a very low concentration between about 0.05 to 0.5 mg/L, and the fact that the Barstad working examples entirely omit the leveler.

Moreover, the presence of chloride ion is also only optional in Barstad. Only by inventive insight, or the grossest exercise of hindsight, could one skilled in the art have been expected to make the combination of selections necessary to



arrive at the claimed process, i.e.: (1) to recognize that creep resistance could be reduced by an enhanced chloride content in the copper deposit; (2) to select a bath having a chloride content that can yield the deposit of enhanced chloride content; (3) to recognize that a reaction product of benzyl chloride and hydroxyethyl polyethylenimine would function as a defect-reducing agent in the electrolytic bath; (4) to recognize that a reaction product of benzyl chloride and hydroxyethyl polyethylenimine would function specifically to enhance the chloride content of the copper deposit; (5) to select a reaction product of benzyl chloride and hydroxyethyl polyethylenimine in preference to the myriad of substituted polyethylenimines that are disclosed in the prior art as useful in copper deposition baths for a different purpose, i.e., as levelers; and (6) to select a concentration of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine sufficient to enhance the chloride content of the deposit.

With respect to multiple features and effects of the process of the claimed invention, prominently including defect reduction and enhancement of the distribution of deposited copper, the June 26, 2007 Office action falls back on contentions of inherency. However, there is no evidence to support the inherency contentions.

Anticipation on the basis of inherency cannot be established unless replication of the teachings of the reference would inevitably and invariably reproduce the process as claimed *in re Oelrich*, 666 F.2d 578 (CCPA 1981); *in re Rijckaert*, 28 USPQ2d 1955 (Fed. Cir. 1994). Inherent anticipation is categorically precluded by the absence from Barstad, and from the patents cited therein, of any disclosure of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine. Inherent anticipation is further precluded by the teaching of

Barstad that the leveling agent is a merely optional component which is used, if at all, at exceptionally low concentrations. Inherent anticipation is still further precluded by Barstad's teaching that the presence of chloride ion is merely optional. Practice of the teachings of Barstad cannot ever lead to a bath comprising the reaction product of benzyl chloride and hydroxyethyl polyethylenimine, and cannot inevitably lead to a process which inherently produces a copper deposit having an enhanced chloride content.

Nor does the Office provide any explanation of why other features that are catalogued as inherent would necessarily and inevitably be present in the instantly claimed process or the copper deposit produced thereby. Since the electrolytic bath of Barstad only optionally includes a leveler, and contains a leveler, if any, at only very low concentrations, and does not include the reaction product of benzyl chloride and hydroxyethyl polyethylenimine, there is no basis for concluding that the bath would include a defect-reducing agent at all. Nor is there any inevitability that a defect-reducing agent would not only be present, but that the selection and amount of a defect-reducing agent according to Barstad would either: (i) reduce high current density edge effect during electroplating (claim 2); (ii) improve distribution of deposited copper over the substrate surface (claim 3); (iii) facilitate deposition of a thinner overall deposit to achieve a minimum thickness across the substrate than an overall deposit required to achieve such minimum thickness by electroplating without a defect-reducing agent that comprises the reaction product of benzyl chloride and hydroxyethyl polyethylenimine (claim 5); (iv) enable the provision of a level substrate by removing a portion of the copper deposit by chemical or mechanical reaction wherein the amount of copper deposit to be removed is less than an amount of

deposit which must be removed by chemical or mechanical action to yield a level substrate in a comparable substrate electroplated without a defect-reducing agent comprising the reaction product of benzyl chloride and hydroxyethyl polyethylenimine (claim 6); or (v) render pitting corrosion by such chemical action less severe than pitting corrosion in a comparable substrate electroplated without such defect-reducing agent (claim 7).

Although the Barstad electrolytic plating bath does contain a divalent sulfur compound as an essential component, there also is no teaching in Barstad from which one skilled in the art could determine that the copper deposit produced by Barstad would inherently contain at least about  $1.5 \times 10^6$  sulfur atoms/cm<sup>3</sup> (claim 70). It is respectfully submitted that the instant record offers no basis other than speculation for the Examiner's conclusion that the claimed sulfur content would have been inherent. But even if the sulfur content were deemed inherent, this would not establish obviousness under §103(a) when considered in light of multiple other differences between the claimed process and the teachings of the Barstad reference(s).

With regard to defect reduction, enhancement of chloride content, and other allegedly inherent features, it is apparently the Examiner's position that it would have been obvious for other reasons to produce an electroplating bath having the combination of components specified in the claims, and that this combination of components would inherently include a defect reducing agent that would function to enhance the overall chloride content of the deposit.

However, in view of the teachings of Barstad and the leveling agent patents cited therein, one skilled in the art would have had no reason, for any purpose, to have substituted

the reaction product of benzyl chloride and hydroxyethyl polyethylenimine for the myriad of leveling agents which the references teach. Unless there was reason to combine for some purpose, there is no basis for obvious under §103(a); *KSR International v. Teleflex*, 82 USPQ2d 1385, 1396 (2007). Both *KSR* and *in re Dillon* recognize that an invention can be deemed obvious if the combination claimed would have been obvious for some purpose, which is not necessarily the inventor's purpose. However, neither *KSR* nor *in re Dillon* found obviousness of a patent claim which contained an element that was not taught by the references but was merely latently inherent in one or more of the references.

As stated in *in re Shetty*, 195 USPQ 753

[Inherency] is quite immaterial if, as the record establishes here, one of ordinary skill in the art would not appreciate or recognize that inherent result  
....

To the same effect are *in re Spormann*, 150 USPQ 49 (CCPA 1966) and *in re Naylor*, 152 USPQ 106, 108 (CCPA 1966). In *KSR* and *Dillon*, the reason to combine references differed from the inventor's reason but the features that were combined were manifest in the references. In *Shetty*, *Spormann*, and *Naylor*, the relevant features were inherent but not manifest and rejections were reversed. On this specific basis, the instant claims are on all fours with *Shetty*, *Spormann*, and *Naylor*, and are distinguishable from *KSR* and *Dillon*.

Evaluating the §103 issues according to the inquiries mandated by *Graham v. John Deere*: (i) the scope and content of the prior art is generally reflected by the art of record; (ii) the differences from the prior art include the use of a defect-reducing agent, the selection of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine as the defect-

reducing agent, and inclusion in the bath of an amount of the defect-reducing agent effective for the formation of a copper deposit having an increased chloride content; and (iii) the level of ordinary skill is indicated primarily by the limited rate of progress reflected in the references, which show no grasp of the significance of the chloride content of the copper deposit or its effect on creep resistance. (From the perspective of education and experience, the level of skill might be viewed as that possessed by a B.S. chemist or chemical engineer with some experience in formulating electrolytic baths for copper deposition).

Strong secondary evidence of non-obviousness includes the benefit in creep resistance achieved by increasing the chloride content of the copper deposit.

As measured by several pertinent factors, it is respectfully submitted that the gap between the claimed process and the prior art is substantial, and that bridging that gap would have been beyond the routine skill expected in the art. For example, the Examiner has cited no purpose or reason why one skilled in the art would choose the reaction product of benzyl chloride and hydroxyethyl polyethylenimine instead of one of the myriad of leveling agents disclosed in Barstad and the references cited therein. Moreover: (1) nothing in Barstad, any other reference of record, or the routine skill in the art would have provided a reason to incorporate an additive that would enhance the chloride content of the copper deposit; and (2) nothing in the references or the level of routine skill would have suggested any purpose at all for achieving an enhanced chloride content; and (3) nothing in the references or the level of routine would have remotely suggested that the reaction product of benzyl chloride and hydroxyethyl polyethylenimine could promote such enhancement; and (4) certainly nothing in the

art or the level of skill would have suggested that that the reaction product of benzyl chloride and hydroxyethyl polyethylenimine should be present in "an effective amount ... to increase .... an overall chloride content. Manifestly, there is no basis in the art of record to conclude that the invention as claimed would have been obvious to one of ordinary skill in the art at the time the instant invention was made.

It is therefore respectfully submitted that claims 1-3, 5-7, 65-66, 70-71 and 75-77 are patentable over the references of record under 35 U.S.C. §§102(e) and 103(a).

#### **IV. Rejection of Claims 17, 72 and 73 - 35 U.S.C. §103(a)**

Reconsideration is respectfully solicited of the rejection of claims 17, 72 and 73 under §103(a) as obvious from Barstad 2006/'328.

As in the case of the subject matter of claims 1-3, 5-7, 65-66, 70-71 and 75-77, Barstad 2006/'328 is no more relevant to claims 17, 72 and 73 than Barstad US 6,444,110, the reference which was the basis for the rejection that is withdrawn per the instant action.

Thus, claims 17, 72 and 73 are respectfully submitted to be patentable over the art of record on the same basis as claim 1.

Contrary to the contention in the Office action (p. 9), the Barstad reference(s) entirely fail to disclose or suggest incorporating an effective amount of a defect-reducing agent that either: (i) reduces a rate of recrystallization and grain growth in the copper deposit; (ii) reduces the formation on internal voids within the copper deposit; or (iii) increases the chloride content of the copper deposit as compared to a chloride content of a copper deposit from a comparable electroplating bath not containing the defect-reducing agent. On these further

bases, claim 17 is submitted to be patentable over the Barstad reference(s) under 35 U.S.C. §103(a).

There is no evidence of record that the low concentrations of leveling agent (0.05 to 0.5 mg/L) disclosed in Barstad would have any material effect on rate of recrystallization, grain growth, internal voids, or chloride content. Moreover, since the leveling agent is only optional in Barstad, the concentration of leveler, even if present, would not necessarily reach even the minimal 0.05 mg/L threshold of the 0.05 to 0.5 mg/L range. In fact, the working examples of Barstad contain no leveling agent at all. Finally, even if present, the leveling agent of Barstad is never the reaction product of benzyl chloride and hydroxyethyl polyethylenimine. Consequently, practice of the teachings of Barstad cannot inevitably and invariably yield the features of claims 17, 72 or 73. Lacking the defect-reducing agent specified in all of these claims, practice of the teachings of Barstad can never yield the features of these claims. Nor can any contention of latent inherency form a basis for obviousness; *in re Shetty*, supra, *in re Spormann*, supra, *in re Naylor*, supra.

It is, therefore, respectfully submitted that claims 17, 72 and 73 are patentable over Barstad under 35 U.S.C. §102(a).

#### **V. Rejection of Claims 4 and 67-69 Under 35 U.S.C. §103(a)**

Reconsideration is respectfully requested of the rejection of claims 4 and 67-69 under §103(a) as obvious from Barstad 2006/'328.

It is respectfully submitted that each of claims 4 and 67-69 is patentable over Barstad on the same basis as claim 1.

Moreover, with regard to claim 4, there is no basis for the contention that application of a current of 1-40 ASF for 5 minutes to one hour renders a deposit of about 1 micron obvious

to one of ordinary skill in the art. This combination of current densities and times would yield an exceptionally wide range of deposit thickness. There is no basis in the reference for selection of 1 micron from the 200 fold range encompassed by Barstad's combination of current density and time. Nor is there any remote teaching in Barstad that the thickness would not vary by more than 0.2 microns across the deposit. Note in this regard that the working examples of Barstad do not include even the leveling agents that the reference does actually disclose.

With respect to claims 67-69, there is no remote teaching in Barstad that the concentration of leveler is "result-effective" for the chloride content in the copper deposit. Neither the chloride content of the copper deposit, nor any purpose for incorporating chlorides, nor any additives or other variables affecting chloride content is mentioned or hinted at in the Barstad specification.

As explained hereinabove, the status of the instant claims is fundamentally different from that of the claims at issue in either *KSR* or *Dillon*. In *KSR*, the court held that obviousness could be established if there were a reason to combine elements disclosed in different references, and that it did not matter whether the reason for one skilled in the art to combine is the same as or different from the reason that the inventor chose to combine. Similarly, in *Dillon*, the court held that the tetra orthoesters were obvious from the tri orthoesters because there was reason to select the tetra esters for the same function disclosed in the prior art for the tri esters, i.e. "dewatering" a hydrocarbon fuel.

Here there is no teaching that increased chloride content of the copper deposit would have been "result-effective" for any purpose. Certainly, there is no disclosure that a reaction



product of benzyl chloride and hydroxyethyl polyethylenimine would be result-effective for enhancing the chloride content.

Apparently Barstad concluded that any defects in the copper deposit could be resolved by increasing the concentration of sulfur-bearing brightener compound. Consequently, Barstad offers no reason to include the separately disclosed "levelers." They were purely optional. Not only were they merely optional, but, where present, any added function they might have had is disclosed as being met at minimal concentrations of 0.05 to 0.5 mg/L, or implicitly even lower. Absent evidence that one skilled in the art would recognize the variable in question as result-effective for an identified purpose beyond the range disclosed, selection of this variable at a previously undisclosed concentration to achieve a previously undisclosed or recognized result cannot fairly be dismissed as "mere optimization."

*KSR* says there must have been a reason for one skilled in the art to make the modification or combination that would yield the claimed invention. *KSR* further makes clear that obviousness must be evaluated according to the tripartite *Graham* inquiry not by negative shibboleths such as "mere optimization." Moreover, §103 expressly provides that "[p]atentability shall not be negatived by the manner in which the invention was made."

Under *Graham*, optimization for a disclosed purpose within a disclosed range can be a departure from the prior art that is within the scope of what can be expected from one of ordinary skill. At bottom, this is the rationale of *in re Aller*.

However, there is no evidence of record indicating that a leveler within the suggested 0.05 to 0.5 mg/L range has any real function so far as Barstad et al. are concerned, and there is certainly no evidence of record that optimization within that range would affect the chloride level of the copper deposit,

much less that a value in such range would affect the creep resistance of the deposit. Accordingly, it is respectfully submitted that claims 4 and 67-69 are patentable over the references of record under 35 U.S.C. §103(a).

**VI. Rejection of Claim 74 under §103(a) over Barstad in view of Pederson**

Reconsideration is respectfully requested of the rejection of claim 74 over Barstad 2006/'328 in view of Pederson.

Essentially, it is respectfully submitted that claim 74 is patentable on the same basis as claim 1, from which it depends.

Pederson is apparently cited only for its teaching of semiconductor integrated circuits comprising a silicon wafer. Assuming for purposes of analysis that the use of a silicon wafer would have been within the skill of the art in applying the teachings of Barstad et al., there is nothing in Pederson to remedy the multiple other deficiencies in the disclosure of Barstad.

More particularly, Pederson contains no relevant teachings regarding the inclusion of a defect-reducing agent, the selection of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine as the defect-reducing agent, incorporation of the defect-reducing additive in an amount effective to increase the chloride content of the copper deposit, or selection of an electrolytic plating bath having a chloride content sufficient to contribute to an increased chloride content in the copper deposit.

Accordingly, it is respectfully submitted that the process of claim 74 would not have been obvious to one of ordinary skill in the art under the applicable criteria of 35 U.S.C. §103(a).

**VII. Conclusion**

In view of the foregoing, reconsideration and early allowance of all claims are respectfully solicited.

Respectfully submitted,

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